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TECHNICAL MEMORANDUM
Utah Coal Regulatory Program

August 12, 2010

TO: Internal File

THRU: James D. Smith, Permit Supervisor JDS 8/16/10

FROM: Steve K. Christensen, Environmental Scientist/Hydrologist SKC

RE: Degas Well G-30, Canyon Fuel Company, LLC., Dugout Canyon Mine, C/007/0039, Task ID #3601

SUMMARY:

On August 9, 2010, the Division of Oil, Gas and Mining (the Division) received an amendment from Canyon Fuel Company (the Permittee) for the construction of methane degas well G-30. The proposed degas well will provide additional methane gas venting from the underground workings. The amendment was previously submitted and reviewed two times prior to the current submittal (Task ID #3531 and #3581). Deficiencies were identified the two previous review rounds.

The proposed location for degas well G-30 is a former drilling exploration site. A small access road is located at the site. On November 13th, 2008, Division personnel inspected the site and observed the small access road to be in stable condition. The proposed pad for degas well G-30, as well as the small access road were both observed to be well vegetated at the time of the inspection. Attachment 5-4 contains Plate 4, Pace Canyon Road System. The plate depicts the locations of all degas pads (including G-30) and their associated access roads.

The application provides the hydrologic calculations for runoff volumes from the pad and topsoil stockpiles as well as for the sediment control berms to be constructed. Degas well G-30 is located within the current permit area.

The hydrologic information provided in the Degas Wells G-30 application meets the requirements of the State of Utah R645-Coal Mining Rules and should be approved.

TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

CLIMATOLOGICAL RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.18; R645-301-724.

Analysis:

The application meets the hydrology requirements for Climatological Resource Information as provided in R645-301-724. Page 7-5 of the application provides a reference to Appendix 4-1 of the approved MRP and RA Attachment 7-5 of the Refuse Pile Amendment where climatological data for the permit and adjacent area (which includes proposed degas well G-30) is provided.

Findings:

The application meets the Climatological Resource Information requirements as outlined in the State of Utah R645-Coal Mining Rules.

GEOLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR 784.22; R645-301-623, -301-724.

Analysis:

Geologic information for the proposed location for degas pad G-30 is presented in Chapter 6 of the application as well as in Chapter 6 of the approved MRP. In sections 621 through 627, the approved MRP provides a detailed discussion of the geologic resources within the Dugout Mine's permit and adjacent area (which includes proposed degas well G-30).

Findings:

The information provided meets the Geologic Resource Information requirements as provided in R645-301-724.

HYDROLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 701.5, 784.14; R645-100-200, -301-724.

Analysis:

Sampling and Analysis

The application meets the Sampling and Analysis requirements of the State of Utah R645-Coal Mining Rules. Page 7-3 of the application provides a reference to Section 723 of the approved MRP in regard to Sampling and Analysis. Section 723 of the approved MRP states that water samples will be collected and analyzed according to the methods outlined in "Standard Methods for the Examination of Water and Wastewater" and 40 CFR parts 136 and 434.

Baseline Information

The application meets the Baseline Information requirements of the State of Utah R645-Coal Mining Rules.

In section 724, Baseline Information, the Permittee discusses the ground and surface water resources in the areas of the proposed degas well G-30. Division staff conducted a field inspection of the proposed locations on November 13th, 2008.

Site G-30 is located on the top of plateau. No surface water resources are located within the proposed G-30 drill pad or directly adjacent to it.

The site is accessed via an existing road. Based upon field inspections by Division staff and, no ephemeral, intermittent or perennial streams were located within or adjacent to the proposed location of degas well G-30.

The seep and spring studies of the proposed degas sites are provided in Chapter 7 of the MRP. Plate 7-1 depicts the locations of the springs and seeps identified in those studies. Based upon the spring and seep studies within the approved MRP, and the absence of any ephemeral, intermittent or perennial drainages in the area, it does not appear that the construction and operation of proposed degas well G-30 presents a potential for ground or surface water impacts.

Modeling

The application meets the Environmental Description requirements for Modeling. No ground or surface water modeling was conducted in preparation for the construction of degas well G-30.

Probable Hydrologic Consequences Determination

The application meets the Probable Hydrologic Consequences (PHC) Determination requirements of the State of Utah R645-Coal Mining Rules.

On page 7-7 of the application, the Permittee discusses the probable hydrologic consequences (PHC) for hydrologic resources by utilizing degas wells within the area of degas well G-30. Based upon the presented baseline information (See Section 724 of amendment), no seeps and springs are located within in the area of proposed degas well G-30.

Division staff conducted a field inspection of the proposed locations on November 13th, 2008. During the field inspection of G-30, Division staff noted that the sites appeared to have been previously disturbed. Dugout Mine representative Vicky Miller indicated that the site had been previously disturbed during a exploration activities. Ms. Miller was not sure when the exploration drilling had taken place, but judging by the amount of established vegetation, much time has passed.

The site is accessed via an existing road. Based upon field inspections by Division staff and, no ephemeral, or perennial streams were located within or adjacent to the proposed location of degas well G-30.

The seep and spring studies of the proposed degas sites are provided in Chapter 7 of the MRP. Plate 7-1 depicts the locations of the springs and seeps identified in those studies. Based upon the spring and seep studies within the approved MRP, the absence of any perennial or intermittent drainages and the field inspection, it does not appear that the construction and operation of proposed degas well G-30 presents a potential for ground or surface water impacts.

The Permittee has committed to installing sediment controls prior to construction. The sediment controls will remain in place during construction and operation. The Permittee further commits to leave the sediment controls in place during reclamation until such time that the Division determines that vegetation has been established and the reclaimed slopes are stable.

As a result of the sediment controls to be implemented at the proposed degas well sites and the overall lack of ground and surface water resources (both within the disturbed area of the proposed degas well) present at the site, the potential for impacts to the hydrologic balance are minimal.

Findings:

The application meets the Hydrologic Resource Information requirements of the State of Utah R645-Coal Mining Rules.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.24, 783.25; R645-301-323, -301-411, -301-521, -301-622, -301-722, -301-731.

Analysis:

Subsurface Water Resource Maps

Plate 7-1, *Hydrologic Monitoring Stations*, of the approved MRP depicts the subsurface water resources in the vicinity of proposed degas well G-30.

Surface Water Resource Maps

Plate 7-1, *Hydrologic Monitoring Stations*, of the approved MRP depicts the surface water resources in the vicinity of proposed degas well G-30.

Findings:

The hydrologic information provided meets the Maps, Plans and Cross Sections of Resource Information requirements as provided in R645-301-722 and R645-301-731.

OPERATION PLAN

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: 30 CFR Sec. 784.24, 817.150, 817.151; R645-301-521, -301-527, -301-534, -301-732.

Analysis:

Plans and Drawings

The application meets the Plans and Drawings for Road Systems and Other Transportation Facilities requirements of the State of Utah R645-Coal Mining Rules.

Based upon a field inspection performed by Division personnel on November 13th, 2008, it was observed that degas well G-30 is accessed via an existing road. No new road construction will be necessary for the construction and utilization of degas wells G-30.

The Permittee has revised Plate 4, *Pace Canyon Road System* of Attachment 5-4 to depict the location of degas pads G-30 and it's associated access roads.

Findings:

The application meets the Road Systems and Other Transportation Facilities requirements of the requirements of the R645-State of Utah Coal Mining Rules.

SPOIL AND WASTE MATERIALS

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

Analysis:

Disposal of Noncoal Mine Wastes

The application states that no hydrocarbon products will be stored at the well sites. However, the Permittee has stated that absorbent materials will be used for the collection of leaked fuels, greases and other oils that may be spilled during the installation of the vent holes. The saturated absorbent materials will then be disposed of at an appropriate landfill facility.

Findings:

The hydrologic information provided meets the Spoil and Waste Materials Operation requirements as provided in R645-301-747.

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, **-301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.**

Analysis:

General

The application meets the requirements for General Hydrologic information as required by the State of Utah R645-Coal Mining Rules. The Hydrologic Information is presented in chapter 7 of the application. The application discusses the potential impacts to hydrologic

resources, provides the design criteria and hydrologic designs utilized at the degas site and also provides the applicable hydrologic performance standards for the drainage features at the degas sites.

Acid- and Toxic-Forming Materials and Underground Development Waste

The application states that no acid or toxic forming materials have been identified in the soils or strata of the Dugout Canyon Mine. The application references Appendix 6-2 of the approved MRP that outlines the finding that the Dugout Canyon Mine area does not contain potentially acid forming or toxic material. The application also references Chapter 6, Section 623 of the Methane Degasification Amendment, which states, "No acid or toxic forming materials will originate at the well sites."

Diversions: General

The application meets the Diversions: General requirements of the State of Utah R645-Coal Mining Rules. The construction and operation of degas well G-30 will not require a diversion of an ephemeral, or perennial drainage.

Stream Buffer Zones

The application meets the Stream Buffer Zone requirements of the State of Utah R645-Coal Mining Rules.

Based upon field inspections by Division staff as well as the baseline information presented in section 724 of the Methane Degasification Amendment, no ephemeral, intermittent or perennial streams are located within or adjacent to the proposed disturbed area for degas well G-30.

Sediment Control Measures

The application meets the Sediment Control Measure requirements of the State of Utah R645-Coal Mining Rules.

The application discusses sediment control measures in Sections 532, 732, 742 and 752. Beginning on page 7-22 of the application, the Permittee discusses specific sediment control measures and practices to be implemented during the construction and operation of the proposed degas wells.

The Permittee commits to utilizing berms, silt fences and/or straw bale dikes to control sediment transport off the disturbed area. The sediment controls will be installed prior to construction and will be maintained through the operational and reclamation phases. Sediment

controls will be installed prior to construction and will remain in place during the operational and reclamation phases of the degas pads and associated roads. Removal of the structures during reclamation is addressed in Section 761.

The Permittee commits to periodically inspecting all degas drill sites and associated access roads. The inspections will include, but not be limited to inspections following major precipitation events. Based upon the inspections, the sediment controls will be repaired and accumulated sediment removed as needed in order to maintain functionality and retain sediment on the disturbed area.

In addition, the Permittee commits to bi-annual inspections of the sediment controls with Division staff: one inspection in the spring/early summer and one in the fall. Based upon those inspections, the Permittee commits to repairing the sediment controls as needed in a timely fashion following the spring/early summer inspection and prior to the onset of winter/non-accessible conditions following the fall inspection.

The sediment control measures utilized at the degas pads and associated access roads will be maintained until removal is authorized by the Division and the disturbed area has been stabilized and revegetated (See Section 761 of the application).

Siltation Structures: General

The application meets the Operational Plan requirements for Siltation Structures: General as provided in R645-301-742.212. No sediment ponds are proposed for this project.

Siltation Structures: Other Treatment Facilities

The application meets the Siltation Structures: Other Treatment Facilities requirements of the State of Utah R645-Coal Mining Rules.

The application provides calculations and design considerations for the berms and containment structures to be utilized at the proposed degas sites. Attachment 7-1 provides the hydrologic calculations for proposed degas well G-30. The Permittee will utilize a combination of silt fence and earthen berms to contain storm water runoff on the proposed degas well sites.

The berms were designed by utilizing the Soil Conservation Service (SCS) method for calculating peak flows. The SCS method incorporates generalized loss-rate and runoff relationships developed from watershed studies in the United States. A total runoff volume was calculated for the pad areas utilizing a 10-year, 24-hour rainfall event as required by state regulations (Other Treatment Facilities--R645-301-742.230). Berm dimensions were then calculated to contain the design storm event for each of the three areas outlined above. The

application provides the calculations utilized in determining the proper silt fence and berm sizing to handle the 10-year, 24-hour storm event.

Impoundments

The application meets the Impoundment requirements of the State of Utah R645-Coal Mining Rules.

No permanent impoundments will exist at degas well G-30. In order to install the degas well, a hole/impoundment will be constructed to handle safely handle/store the drilling fluid. However, upon the completion of degas activities, the hole/impoundment will be backfilled and reclaimed.

Findings:

The hydrologic information provided meets the Hydrologic Information requirements of the State of Utah R645-Coal Mining Rules

MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

Analysis:

Mining Facilities Maps

The application meets the Mining Facilities Maps requirements of the State of Utah R645-Coal Mining Rules.

The initial technical analysis (Task ID #3531) identified a deficiency with a figure in Attachment 5-2 (labeled as 'Attachment 5-2, *Location of Methane Drainage Wells*). The Permittee was asked to revise the figure to depict proposed degas well G-30 as well as previously permitted degas wells G-22, G-25, G-26 and G-29. The Permittee revised the figure to depict proposed degas well G-30 as well as the aforementioned degas wells that had been permitted previously.

However, the figure depicted the access roads to degas wells G-16, G-18, G-22 and G-31 as 'existing'. The access roads to these sites were not pre-existing roads prior to the construction of the degas wells. As a result, a deficiency was written during the last technical analysis (Task ID #3581). The Permittee has revised the figure in Attachment 5-2, Location of Methane

Drainage Wells, to accurately reflect the nature of the access roads to the degas wells (i.e. pre-existing or constructed).

The initial technical analysis (Task ID#3531) identified a deficiency relative to the legend of Plate 4 of Attachment 5-4, *Pace Canyon Road System*. The Permittee was directed to revise the legend to identify what the double red lines denote on the figure.

During the second technical analysis (Task ID #3581), the Permittee submitted Plate 4 of Attachment 5-4 and had replaced the double red lines with double green lines, which the legend denoted as 'existing roads'. The access roads to degas well sites G-16, G-18, G-22 and G-31 did not exist roads prior to the construction of the aforementioned degas wells. As such, a deficiency was written to correct the discrepancy.

The Permittee has revised Plate 4 of Attachment 5-4, *Pace Canyon Road System*, to accurately reflect the nature of the degas wells access roads.

Findings:

The application meets the Mining Facilities Maps requirements of the State of Utah R645-Coal Mining Rules.

RECLAMATION PLAN

GENERAL REQUIREMENTS

Regulatory Reference: PL 95-87 Sec. 515 and 516; 30 CFR Sec. 784.13, 784.14, 784.15, 784.16, 784.17, 784.18, 784.19, 784.20, 784.21, 784.22, 784.23, 784.24, 784.25, 784.26; R645-301-231, -301-233, -301-322, -301-323, -301-331, -301-333, -301-341, -301-342, -301-411, -301-412, -301-422, -301-512, -301-513, -301-521, -301-522, -301-525, -301-526, -301-527, -301-528, -301-529, -301-531, -301-533, -301-534, -301-536, -301-537, -301-542, -301-623, -301-624, -301-625, -301-626, -301-631, -301-632, -301-731, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-732, -301-733, -301-746, -301-764, -301-830.

Analysis:

The reclamation plan is presented in section 540 of the application, with additional information provided in Attachment 5-4. Natural drainage patterns will be restored after degasification is completed. The cut and fill slopes will be reshaped at the well sites. When a siltation structure is removed, the land on which the siltation structure was located will be regraded in accordance with the reclamation plan presented in Section 540. Upon the termination of degasification efforts, the gob vent holes will be sealed in accordance with Federal Regulations 43 CFR CH. 11, Subpart 3484, (3) per a decision by the BLM and the Division.

Figure 5-26 of the methane degasification amendment provides a reclamation schedule for the wells and associated access roads. The figure gives an estimate of how long each of the phases of reclamation will take to complete. Additionally, Table 1 of Attachment 5-1 provides an estimate of when final reclamation activities will occur at each specific degas well.

On page 5-18 of the amendment, the Permittee states, "The determination of when the degas pads, and in some cases roads, will be reclaimed involves the evaluation of multiple commitments within the permit, weather, landowner requests, as well as safety and other MSHA regulations such as ventilation". In addition, Attachment 5-2 contains a table that outlines the year the pads are constructed, when the wells are to be plugged as well as the proposed final reclamation date.

Findings:

The application meets the Reclamation Plan requirements of the State of Utah R645-Coal Mining Rules.

APPROXIMATE ORIGINAL CONTOUR RESTORATION

Regulatory Reference: 30 CFR Sec. 784.15, 785.16, 817.102, 817.107, 817.133; R645-301-234, -301-412, -301-413, -301-512, -301-531, -301-533, -301-553, -301-536, -301-542, -301-731, -301-732, -301-733, -301-764.

Analysis:

On page 5-20, the Permittee states, "The well sites, G-22 access road and AMV road will be returned to their approximate original contour after reclamation is completed." Drainages will be restored following the removal of the culvert and any associated structures. Attachment 5-1 of the application provides cross-sections that depict the final surface configurations of the degas pads following reclamation.

Findings:

The application meets the Approximate Original Contour requirements of the State of Utah R645-Coal Mining Rules.

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: 30 CFR Sec. 701.5, 784.24, 817.150, 817.151; R645-100-200, -301-513, -301-521, -301-527, -301-534, -301-537, -301-732.

Analysis:

Reclamation

The application meets the Reclamation of Road Systems and Other Transportation Facilities requirements of the State of Utah R645-Coal Mining Rules.

The roads that existed prior to the drilling program will be retained after reclamation. The access roads established during the drilling program will be reclaimed after methane extraction has been completed.

As degas well G-30 is accessed via an existing road, the road reclamation requirements of the State of Utah R645-Coal Mining Rules do not apply to this amendment. The access road will be retained following the completion of methane degasification activities at the site.

Findings:

The application meets the Reclamation of Road Systems and Other Transportation Facilities requirements of the State of Utah R645-Coal Mining Rules.

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

Regulatory Reference: 30 CFR Sec. 784.14; R645-301-730.

Analysis:

The potential for impacts to the hydrologic balance from the construction and operation of proposed degas well G-30 is minimal. As such, a revision to the Cumulative Hydrologic Impact Assessment is not necessary with this amendment.

Findings:

The hydrologic information provided meets the Cumulative Hydrologic Impact Assessment requirements as provided in R645-301-730.

RECOMMENDATIONS:

The hydrologic information provided in the application meets the requirements of the State of Utah R645-Coal Mining Rules and should be approved at this time.